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8 VALLEY WATER MANAGEMENT COMPANY

9
10 BEFORE THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
11 FOR THE CENTRAL VALLEY REGION
12

13 In the Matter of:

14 TENTATIVE CEASE AND DESIST
15 ORDER R5-2019-0XXX FOR VALLEY
16 WATER MANAGEMENT COMPANY'S
17 McKITTRICK 1 & 1-3 FACILITY, KERN
18 COUNTY

19 VALLEY WATER MANAGEMENT COMPANY'S
20 REBUTTAL

21 Although not required by state administrative procedures (*see* 23 C.C.R. §648.4(f)),
22 Valley Water Management Company ("Valley Water") provides the following initial rebuttal to
23 allegations of the Staff of the Regional Water Quality Control Board for the Central Valley
24 Region ("Staff"). As stated in its May 16, 2019 Objections to the Response to Comments
25 ("RTC"), due to the unreasonably short time frame allotted for Valley Water to provide its
26 Rebuttal, Valley Water reserves the right to provide additional rebuttal evidence at the hearing on
27 the tentative Cease and Desist Order ("CDO"). For ease, Valley Water has organized its Rebuttal
28 in the same order as the RTC.

29 **I. Valley Water's Rebuttal to Each Response to Valley Water's Comments**

30 **RTC Comment 1:** The primary purpose of the CDO is to establish an enforceable timeline under
31 which Valley Water will obtain a new permit or cease operations. Existing data indicate that
32 wastewater management practices at the Facility would need to significantly change for Facility
33 discharges to protect beneficial uses in downgradient groundwater. Valley Water can either gather
34 additional data to refute existing information that indicates downgradient impacts, propose facility
35 upgrades that would be regulated under a new permit, or cease discharging.

36 **REBUTTAL:** A CDO is unnecessary for this purpose as Staff was already instructed by
37 the Regional Board Members over a year ago to issue Valley Water an updated permit.
38 (*See* Res. No. R4-2018-0015 (April 2018).) Valley Water has no control over the timing
39 of the issuance of any permit, and if the Staff does not act quickly to draft and issue a
40 permit, the timeframe set forth in the Tentative CDO could expire due to no fault of
41 Valley Water. Instead of a CDO, Staff should be instructed to timely comply with
42 Resolution No. R4-2018-0015. Valley Water has submitted a Report of Waste Discharge

1 (“ROWD”) (Exhibit 2) along with a draft Waste Discharge Requirements (“WDR”) (Exhibit 3), doing most of the work needed. All that remains is for Valley Water to be
2 issued a permit and for Valley Water to continue to work on getting monitoring wells
3 installed so that the data gaps recognized by Valley Water, the Regional Board, and Staff
4 can be filled pursuant to the requirements in Valley Water’s 2018 Monitoring and
Reporting Program (“MRP”).

5 **RTC Comment 2:** Resolution R5-2018-0015 directed Board staff to take appropriate action to
6 determine whether Valley Water’s discharge may be regulated under one of the General Orders or
7 whether regulation under a separate Order would be more appropriate. Existing water quality data
indicate downgradient impacts [sic] to groundwater east of the Facility that supports the MUN
and/or AGR beneficial uses, making the facility ineligible for General Order No. 3.

8 Valley Water has alleged that the information that indicates downgradient impacts to beneficial
9 uses is erroneous. Although Valley Water expected to expand its monitoring well network to
10 collect data to show that their discharge is not impacting downgradient water, additional water
11 quality data from new wells was not collected. On page 10 of the Valley Water response, Valley
12 Water states that it “expects most of the ten wells to be installed in May 2019 with any remaining
drilling soon after September of 2019.” Should Valley Water show that there are no downgradient
impacts to beneficial uses in the timeframe outlined in the CDO, the facility may be eligible for
regulation under General Order No. 3.

13 **REBUTTAL:** Although the CDO and Staff Report allege produced water from the
14 McKittrick facility may be causing impacts to water quality and beneficial uses off-site
15 and downgradient of the Facility, those allegations are based on the opinions of Staff, not
16 on facts and evidence (*see*, for example, the CDO at page 23: “Staff believes there is a
17 good chance that produced wastewater traveling through channels of coarse grained
18 materials has migrated from the Valley Water Facility”; *see also* Valley Water’s
19 Objections, filed May 16, 2019). Staff opinion that the facility is ineligible for General
20 Order No. 3 is also based on these beliefs. Furthermore, Valley is no longer requesting
21 coverage under General Order No. 3, but instead provided a draft ROWD to support an
22 individual WDR (Exhibit 3), which Staff ignored in its RTC. However Valley
23 acknowledges that the downgradient wells will provide additional information to support a
24 permit, as already required by the Regional Board in Resolution No. R4-2018-0015.
Valley Water has provided monthly reports to Staff regarding efforts to obtain necessary
permits and landowner access agreement required before Valley Water may install the
downgradient wells. (*See e.g.*, Exhibits 28 and 30.) Valley Water’s response to the CDO
provided further information regarding diligently proceeding with approvals for work
within the area of the fully-protected Blunt Nosed Leopard Lizard. As stated in its
Objections, Valley Water contends that this CDO hearing is premature pending the results
from these wells, because that data may show that an individual WDR or coverage under
General Order 3 could be the appropriate regulatory pathway.

25 **RTC Comment 3:** Board staff agree that the water directly beneath the Facility is of poor quality
26 and would probably not support the MUN and AGR beneficial uses. However, staff does not
27 agree that there were no AGR uses around the Facility historically. Satellite images indicate that
28 farming was occurring less than a mile north of the Facility at least as far back as 1975. Starrh
Farms uses the groundwater to irrigate crops, demonstrating an existing AGR beneficial use.
Additionally, area groundwater has the quality needed to meet the designated beneficial uses of
MUN and AGR as shown by Attachment N of the Staff Report and supplemented with additional
data presented on Attachments 1.1 and 1.2 of this response to comments (RTC).

1 Water quality data from both Clean Harbor's wells and agricultural wells just north of Clean
2 Harbors show that groundwater in that area meets or previously met thresholds in the Sources of
3 Drinking Water Policy, State Water Resources Control Board Resolution 88-63, and the Board
4 would not therefore consider de-designating the MUN beneficial use from these waters.
Furthermore, this groundwater also may support the AGR beneficial use and should be protected
(just because the groundwater may not be suitable for salt-sensitive crops, that does not justify
removing the AGR beneficial use).

5 **REBUTTAL:** Valley Water's Expert Ken Schmidt will testify at the hearing to the
6 following: Starrh Farms used only aqueduct water for crop irrigation prior to 2003. Well
7 completion reports indicate that WW-1 was completed in May 2003 and WW-2 was
8 completed in March 2003. These were the first irrigation wells constructed for Starrh
9 Farms that he is aware of. These wells were to provide a supplementary water supply for
10 irrigation because California Aqueduct deliveries to the Belridge Water District were
11 reduced as of 2003 due to Delta issues. Since 2003, water from WW-1 and WW-2 and
12 aqueduct water has been blended and used to irrigate crops immediately north of the Clean
13 Harbors facility. Chemical analysis of water from Well No. WW-1 for a water sample
14 collected in February 2008 showed a Total Dissolved Solids (TDS) concentration of 5,860
15 mg/L and the chloride concentration of 1,800 mg/L, which would not support either an
16 AGR or MUN beneficial use without blending. (Data for these wells can be found at:
17 [SUPPLEMENTAL TECHNICAL INFORMATION, SOUTH BELRIDGE OIL FIELD
\(STARRH & STARRH COTTON GROWERS TRIAL RELATED DOCUMENTS\);
https://geotracker.waterboards.ca.gov/regulators/deliverable_documents/3595714747/Aera
%20E_Supplemental_Tech_Info_5-23-2005.pdf](https://geotracker.waterboards.ca.gov/regulators/deliverable_documents/3595714747/Aera%20E_Supplemental_Tech_Info_5-23-2005.pdf) (designated Exhibit 25).) The
concentrations of these constituents increased substantially after 2003, due to the enhanced
easterly flow of a plume from percolation of produced water from the previous Aera ponds
or other produced water facilities north of the McKittrick facility, which was/is not owned
or operated by Valley Water. Numerous other pond facilities operated in that northwest
area of Kern County. (See Exhibit 26 (Figure 1 – South Belridge Oil Field Groundwater
Monitoring Wells - map of ponds and wells).)

18 **RTC Comment 4:** The westside Water Quality Coalition is not requesting that the AGR
19 beneficial use be de-designated from the Regional aquifer (lower/deeper Tulare sands). The
20 coalition is only requesting that the Board consider de-designating the AGR beneficial use from
21 the unconfined perched water (Upper perched zone beneath Clean Harbors and Alluvium near
Valley Water monitoring network) and the semi-confined perched groundwater zone
(Intermediate perched zone beneath Clean Harbors and upper Tulare sands near the Valley Water
monitoring network). This would not justify a conclusion that the water potentially affected by the
Facility's discharges is naturally poor.

22 **REBUTTAL:** Valley Water's Exhibit 14 states that the Westside Water Quality Coalition
23 ("WWQC") is seeking to delist MUN from both perched and unconfined/semiconfined
24 groundwater in a portion of the WWQC area, to delist AGR in perched groundwater, and
25 to modify AGR designations in the unconfined/semiconfined groundwater in portions of
26 the WWQC area to be consistent with the aquifers water quality (See Exh. 14, Sept. 19,
27 2016 Cover letter and work plan page ES-1.). That document found that groundwater
28 quality in the study area is influenced by the natural salinity of native soils and cited a
regional groundwater study conducted by the United States Geologic Survey in the 1950s
(USGS, 1959), which indicated high salinity groundwater in areas that predated
agricultural development and irrigation. (Exh. 14 at p. 6.) This report also shows that most
local water for MUN use comes from imported surface water or imported groundwater.

(*Id.*) The data in that table shows that imported surface water and imported groundwater meet the recommended Secondary Maximum Contaminant Levels (SMCLs) for salinity constituents. However, locally sourced groundwater within the WWQC does not meet recommended SMCLs for two or more constituents. Based on the review of domestic well water uses, only two water systems could be identified that used groundwater for limited MUN:

- One well (23S/20E-17) produces water for domestic supply at the far western extent of BMWD. An expensive point-of-use (under-sink) water treatment system (ion exchange plus reverse osmosis [RO]) is used to treat drinking water for one residence.
- One well (23S/20E-17) is used for water supply in toilets and sinks (but bottled water is used for drinking water). (*Id.* at pg. 7.)

The report further found that local unconfined/semi-confined groundwater contains less salinity than the perched groundwater, but still typically exceeds the drinking water standards for TDS, sulfate, and boron in certain areas (see, Exh. 14, Tables 5 and 6; Figures 4 through 6). Unconfined/semiconfined groundwater contains elevated concentrations of these constituents based primarily on natural processes (contact with marine sediments). The average TDS, sulfate, and boron concentrations (4,230 mg/L, 990 mg/L, and 9.5 mg/L) exceed the corresponding drinking water quality criteria (1,000 mg/L, 500, mg/L, and 5 mg/L, respectively). (Exh. 14 at pg. 14; Figure 6 (showing high boron levels (>15 mg/L) in the area closest to McKittrick area.) Despite the clear data showing the inappropriateness of the designated uses based on historical data, the proposed designation process is anticipated to take at least 5.5 years. (*Id.* at pg. 17.)

Attachment 1.1 by Staff provided TDS concentrations for water from a number of wells. Staff referred to as the Regional Aquifer in Comment No. 4. The historical hydrogeologic studies for the area east of the California Aqueduct have delineated two major aquifers. The upper aquifer is above the Corcoran Clay or its equivalent, and the lower aquifer is below this clay or its equivalent. The lowest values to the northeast (409 mg/L and 973 mg/L) in Attachment 1.1 are for the lower aquifer, whereas the value of 2,396 to the northeast is for the upper aquifer. Lumping the two aquifers into one is not considered technically correct, because the lower aquifer is the one that has been primarily used, due to the high salinity of water in the upper aquifer.

RTC Comment 5: Figure 2-7 of the Valley Water document referred to in this comment is a TDS concentration map of production zone water as defined by the CV-SALTS program. The concentration for the area referred to in this figure is for TDS concentrations greater than 1,000 mg/L. While 1,000 mg/L TDS is not great quality water, it can support the MUN and AGR beneficial uses.

REBUTTAL: The Figure cited was to show that water quality on the west side of Kern County generally contains substantially higher salt levels than other areas. Closer review of the actual data shows that many areas near the McKittrick facility routinely exceeded 3,000 mg/L TDS before 1989 (see Exhibit 25). Review of local data available before the 1989 Basin Plan amendment, prior to designating uses, demonstrates that many areas where MUN designations were made were erroneous and inaccurate because TDS levels exceeded 3,000 mg/L and met other exemption criteria as well.

RTC Comment 6: Board staff disagree with Valley Water's interpretation of the data. Attachment 2.1 displays isotopic data from the Clean Harbors monitoring wells and Attachment 2.2 displays the data from Valley Water and Clean Harbors monitoring wells. There is a significant change in the isotopic signature of water in MW-148I (2 data points 5/2017 & 2/2019); water quality in MW-148I is becoming more like produced wastewater indicating an increased contribution of wastewater. The isotopic signature of water in MW-102RL has also slightly moved towards becoming more like wastewater. Data plotted on a Piper diagram (Attachment 3) shows that groundwaters in MW-102RL and MW-148I are becoming more chloride enriched as indicated by increase in the percentage of milliequivalents of chloride compared to sulfate. There are also increasing TDS, chloride, and boron trends in the Clean Harbor Wells (Attachments 4.1, 4.2, and 4.3). Board staff have interpreted these changes are most likely the result of impacts from produced water, and the most likely source of produced water is the Valley Water discharges at the Facility. Board staff is not aware of any other recharge source(s) that would be causing the multitude of impacts in the quality of water in wells CYM-21D1, MW-102RL, and MW-148I.

The water quality and hydrogeologic data collected by Valley Water do not define the extent of the wastewater migration. The referenced figure, shown on page 12 of Valley Water's comments (shown in this document as Attachment 5), shows the purported extent of the wastewater plume as predicted by a computer model in the upper Tulare sands. This prediction has not been verified with field data. Also, it contradicts Valley Water's allegation that the impacts observed in the regional aquifer groundwater in CYM-21D1 are caused by a faulty well casing allowing wastewater in the upper Tulare sands zone to leak down to the regional aquifer. According to the figure, the wastewater in the upper Tulare sand zone stops approximately 1800 feet east of well CYM-21D1.

Board staff has prepared cross sections A-A' and B-B' based on the available boring and electric logs (Attachments 6.1 and 6.2), that present graphic grain size analyses for each of the monitoring wells. Cross section B-B' shows that at well CYM-17Q1, what Valley Water refers to as the Upper Tulare Clay on their cross sections, is primarily silt and sand combinations that may not restrict the vertical migration of wastewater. This would appear to be an area that allows the downward movement of fluids into the regional aquifer. In addition, the second quarter 2018 monitoring report for the McKittrick Facility (Attachment 7) shows a much lower water table elevation for well CYM-17Q1 when compared to well CYM-17K1. It appears that the absence of significant clay in the perching layer (upper Tulare clay) is allowing water to migrate vertically and resulting in water levels in well CYM-17Q1 that do not match well CYM-17K1 or well CYM-21D1 (Attachment 8). It appears the reason groundwater elevations have not increased in well CYM-17Q1 is that the water is draining into the regional aquifer.

REBUTTAL: Valley Water's response to the CDO presented an extensive discussion of the interpretation of the Piper diagrams and isotopic data, and the Staff's response does not alter those facts. Although the response states that Staff is not aware of any other recharge sources, Valley Water has presented evidence of irrigation using in part produced water from the Aera or other northern area ponds that migrated southeast to the Starrh wells, and information from the CV-SALTS program that demonstrate poor quality of water associated with sources other than McKittrick.

Valley Water agrees with Staff that the groundwater flow model needs to be further constrained by the results of the planned downgradient wells. The model was developed in consultation with Staff, and was used in its present state to identify areas that require further field evaluation. Once those data are available, Valley Water anticipates continuing to work productively with Staff to complete the model and make it a useful tool for decision-making at the site.

1 Additionally, Valley Water takes issue with Staff's unsupported statement that, at Well
2 CYM-17Q1, the deposits for the Upper Tulare Clay were "primarily silt and sand
3 combinations." Valley Water's Expert Ken Schmidt reviewed both the geologic log and
4 electric log for Well 17Q1 and found that clay was indicated in three strata between 82 and
5 117 feet in depth (82 to 86 feet, 97 to 106 feet, and 111 to 117 feet). For the interval
6 between 82 and 117 feet in depth, the three clay layers comprised a total thickness of 19
7 feet, or about two-thirds of the deposits in the whole interval. The combined clay layers
8 would function as a restricting layer and limit downward movement of groundwater into
9 the underlying strata.

10 Attachments 6.1 and 6.2 to the RTC contain two cross sections constructed by Board
11 Staff. Both cross sections indicate question marks ("??") for many of the contacts. While
12 Valley Water agrees that the contacts indicated may be speculative at this point, Valley
13 Water is in the process of installing wells that will help resolve these questions. Valley
14 Water again points to its Objections to the current hearing date, and again requests that
15 this hearing should be rescheduled to after the new data are available and a more
16 meaningful discussion can be conducted, instead of adopting a CDO that is only supported
17 by numerous question marks.

18 **RTC Comment 7:** The boring log for well CYM-17K1 noted wet coarse-grained material
19 (sand/gravel) above the CCE when it was drilled. Valley Water failed to collect a sample from
20 this wet zone and does not have any monitoring wells screened above the CCE, thus additional
21 monitoring wells screened above the CCE are needed to address this data gap of whether
22 groundwater exists above the CCE.

23 The Facility and its monitoring network are located on alluvial fan deposits that characteristically
24 contain channel deposits that act as preferential pathways, allowing groundwater to move
25 relatively quickly laterally and downgradient. Attachment 9 is a block model of alluvial fan
26 sediments and what would typically be expected in these types of deposits. The block diagram
27 shows that we would expect channel deposits trending down the alluvial fan that contain coarse-
28 grained permeable sediments that would act at preferential pathways for the lateral migration of
fluids. Where these channels cut through the finer-grained deposits, aquitards may not be present
and fluid can migrate vertically in those areas. It is possible for channels to cut through the CCE
and upper Tulare clay, and it is also possible that the CCE and upper Tulare clay are
discontinuous between Valley Water wells and Clean Harbors wells (See Attachments 6.1 and
6.2). The groundwater beneath Clean Harbors is lower in elevation, including the upper perched
zone, when compared to CYM-17K1. If the CCE is discontinuous, it could allow the wastewater
plume to pass through the CCE and to mix with the water in the upper perched zone and with the
water in the intermediate perched zone beneath Clean Harbors. Well MW-148I is completed in
the second water bearing zone at the Clean Harbors facility and any impact from downgradient
activities (such as agriculture) in the Clean Harbors upgradient wells would have to go through
that upper perching layer and migrate upgradient; while not impossible, this seems unlikely.

REBUTTAL: Moisture above the CCE will be evaluated during installation of the
scheduled wells. Staff assumed that the use of the word 'wet' in the boring logs for
monitoring well CYM-17K1 and other wells means that saturated conditions were
observed in the soil/sediment samples collected during drilling. However, there is no
direct indication of saturated soil conditions or perched groundwater. Furthermore, the
other boring logs for Valley Water's monitoring wells did not note this condition.

Staff may be correct that some areas above the CCE may show limited perching, in part because we observe this downgradient at the Clean Harbors facility, where the CCE does act more like a confining layer than beneath McKittrick. However, the occurrence of perched water in both the Upper Perched Zone and the Intermediate Perched Zone beneath Clean Harbors is not continuous, and flow directions have been variable since wells have been monitored starting in the late 1980s. The map on the next page from Clean Harbors' 2014 monitoring shows the consistent observation that Upper and Intermediate perched zones are not continuous, and in particular may not extend very far to the west. Wells south and west from the line labeled "approximate extent of saturation in Upper Perched Zone" are dry for both upper and intermediate perched wells.

The groundwater flow direction is shown to the east. In the 1990s and early 2000s, the flow direction in the Upper Zone was to the south and east, but further work to define the extent of saturation identified some barriers to flow and the interpreted flow direction was modified to the east. The groundwater flow direction in the Intermediate Zone was also consistently to the south and east. In both of these zones beneath Clean Harbors, it is not clear that there is any hydrogeological connection to the produced water from the McKittrick facility. The Upper Zone is consistently shown as isolated by the Corcoran Clay Equivalent, which would require water from McKittrick to flow downgradient in the Intermediate Zone, then flow UP through the Corcoran Clay Equivalent, an unlikely scenario. In addition, the Upper Zone beneath Clean Harbors does not extend west towards McKittrick in any clear way. The Intermediate Zone beneath Clean Harbors is similarly isolated by dry zones to the west, limiting connection to the produced water from the McKittrick facility. The following figure shows the location of Clean Harbors Intermediate Zone well S; it was dry upon installation and has not had water. It further extends the dry zone between McKittrick and Clean Harbors, because Clean Harbors does not typically plot this dry zone wells in their quarterly monitoring reports.



1 In any case, the need for additional shallow zone wells will be discussed with Staff as we
2 work together to further develop the groundwater flow model.

3 Staff stated that “MW-148i is the second water bearing zone at the Clean Harbors facility
4 and any impacts from downgradient activities (such as agriculture)....” Discussions of
5 what is upgradient or downgradient need to also consider the vertical situation. The
6 irrigated lands immediately north of MW-148I are upgradient of MW-148I in the vertical
7 sense. Deep percolation of excess applied irrigation water would move downward
8 through the vadose zone to the perforated interval for MW-148I. The constituents in this
9 percolating water would be considerably concentrated compared to those in the irrigation
10 water due to evapotranspiration of crops, particularly because drip irrigation has been
11 used.

12 Valley Water acknowledges that the alluvium above the CCE appears to have formed in
13 an alluvial sand setting. In working collaboratively with Staff in development of the
14 groundwater model, Valley Water also agreed that sand may act as a preferential flow
15 pathway; however, that sand unit overlies the CCE and is within the alluvial deposits. The
16 underlying Upper Tulare Sands are a marginal lacustrine environment, different from an
17 alluvial fan. In lacustrine environments, geological formations tend to be laterally
18 continuous and more uniform than a fan setting. The Upper Tulare Clay also has the same
19 lacustrine depositional environment and, as noted above for well CYM-17Q1, the Upper
20 Tulare Clay is both fine textured and thick enough to restrict downward movement of
21 groundwater.

22 **RTC Comment 8:** Additional hydrogeologic investigation is needed to fill data gaps to answer
23 this question. The fact that the Clean Harbors wells in question are upgradient of agricultural
24 activities leads to a reasonable interpretation that agricultural recharge is probably not the primary
25 culprit to explain the changes. Groundwater pumping is probably the primary reason for an
26 approximate 10-foot elevation drop in Clean Harbor well MW-148I from 2005 to 2018
27 (Attachment H.1 of the Staff Report). As stated in the previous comment, it is possible that
28 groundwater is migrating on top of the CCE and impacting the shallow wells. Board staff does not
claim that all perched groundwater at Clean Harbors is Valley Water discharge. The water quality
changes in monitoring well MW-148I are not AGR sourced as demonstrated by the two (2017 and
2019) isotopic signature (oxygen-18 and deuterium) sample points (Attachments 2.1 and 2.2). The
2017 MW-148I sample point plots closer to the meteoric water line and in 2019 it plots closer to
the wastewater signature which suggests a produced water influence and supports that wastewater
is migrating through preferential pathways down to MW-148I.

Groundwater from MW-102RL is a sulfate type water with a strong chloride influence. It should
also be noted that the chloride component increased from 2017 to 2019 and now plots closer to
wastewater impacted groundwater (Attachment 3) indicating the impact is probably from
produced water. The chloride concentration has gone from 430 mg/L in 2005 to as high as 780
mg/L in the third quarter of 2018 (most recently 630 mg/L).

Attachments 4.2 and 4.4 contain time concentration graphs for chloride and sulfate for MW-
102RL. Board staff is not aware of any other recharge sources to these wells. The tentative CDO
time schedule allows time for Valley Water to gather the data to support their case that the changes
in groundwater quality in the Clean Harbors monitoring wells is being impacted by a source other
than the Valley Water Facility.

1 **REBUTTAL:** When Staff refers to MW-148I and discusses water sources, it should be
2 understood that produced water also historically percolated from Aera and the other
3 produced water facilities to the north (*see* Exhibit 26), was re-pumped from the Starrh
4 Farms wells, and then applied to crops located immediately north of MW-148I. On
5 Attachment 3 (trilinear diagram), the Regional Board noted relatively small increases in
6 chloride percentages between 2017 and 2019 for MW-102RL and MW-148I. However,
7 such a change also occurred for MW-149R1, which was not indicated to be influenced by
8 produced water. Also, Attachment 3 doesn't include the high chloride end member (more
9 than 95% chloride equivalents) that Valley Water provided in Exhibit 15. If this end
10 member is considered, then the Staff's statement that MW-102RL "now plots closer to
11 wastewater imported groundwater" is less evident.

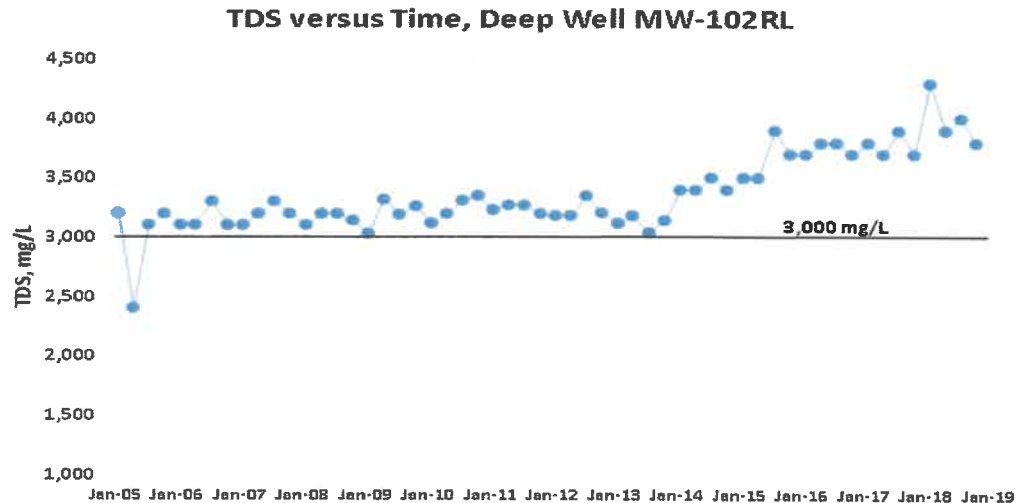
12 The last paragraph states that the "Board staff is not aware of any other sources of
13 recharge to these wells". Two sources of information indicate other sources have been
14 important. First, records for MW-148I indicate decreases in TDS, boron, and sulfate
15 concentrations from 2004 to at least 2010.¹ Seepage from the nearby storm runoff pond or
16 increased irrigation with State Water Project water are possible explanations for this
17 unusual situation. Second, the sharp increases in TDS, chloride, and boron concentrations
18 in water from MW-148I after 2015 suggest that produced water from another source
19 (associated with Starrh Farms irrigation of crops immediately north of the well) was the
20 causative factor, not the McKittrick facility.

21 **RTC Comment 9:** The laboratory data provided by Clean Harbors for well MW-102RL sampled
22 in the second quarter 2005, has a 2,400 mg/L TDS concentration. Staff did not make an error –
23 the TDS concentration in MW-102RL has been below 3,000 mg/L.

24 ¹ See Exhibit 25 data, including, but not limited to:

- 25 Environ Corporation. 1990. Monitoring Well Completion Report, Laidlaw Environmental Services (Lokern), Inc.,
26 Buttonwillow, California. 16 November 1990.
27 TT MFG, Inc. 2005. Revised Monitoring System Plan, Clean Harbors, Volume 1 of 3. 11 April 2005.
28 Cameron-Cole. 2019a. Quarterly Groundwater Monitoring Report, 4th Quarter 2018, Clean Harbors, January 2019.
29 Cameron-Cole. 2018d. Quarterly Groundwater Monitoring Report, 3rd Quarter 2018, Clean Harbors, October 2018.
30 Cameron-Cole. 2018c. Quarterly Groundwater Monitoring Report, 2nd Quarter 2018, Clean Harbors, July 2018.
31 Cameron-Cole. 2018b. Quarterly Groundwater Monitoring Report, 1st Quarter 2018, Clean Harbors, April 2018.
32 Cameron-Cole. 2018a. Quarterly Groundwater Monitoring Report, 4th Quarter 2017, Clean Harbors, January 2018.
33 Cameron-Cole. 2017d. Quarterly Groundwater Monitoring Report, 3rd Quarter 2017, Clean Harbors, October 2017.
34 Cameron-Cole. 2017c. Quarterly Groundwater Monitoring Report, 2nd Quarter 2017, Clean Harbors, July 2017.
35 Cameron-Cole. 2017b. Quarterly Groundwater Monitoring Report, 1st Quarter 2017, Clean Harbors, April 2017.
36 Cameron-Cole. 2017a. Quarterly Groundwater Monitoring Report, 4th Quarter 2016, Clean Harbors, January 2017.
37 Cameron-Cole. 2016d. Quarterly Groundwater Monitoring Report, 3rd Quarter 2016, Clean Harbors, October 2016.
38 Cameron-Cole. 2016c. Quarterly Groundwater Monitoring Report, 2nd Quarter 2016, Clean Harbors, July 2016.
39 Cameron-Cole. 2016b. Quarterly Groundwater Monitoring Report, 1st Quarter 2016, Clean Harbors, April 2016.
40 Cameron-Cole. 2016a. Quarterly Groundwater Monitoring Report, 4th Quarter 2015, Clean Harbors, January 2016.
41 Cameron-Cole. 2015d. Quarterly Groundwater Monitoring Report, 3rd Quarter 2015, Clean Harbors, October 2015.
42 Cameron-Cole. 2015c. Quarterly Groundwater Monitoring Report, 2nd Quarter 2015, Clean Harbors, July 2015.
43 Cameron-Cole. 2015b. Quarterly Groundwater Monitoring Report, 1st Quarter 2015, Clean Harbors, April 2015.
44 Cameron-Cole. 2015a. Quarterly Groundwater Monitoring Report, 4th Quarter 2014, Clean Harbors, January 2015.
45 Cameron-Cole. 2014c. Quarterly Groundwater Monitoring Report, 3rd Quarter 2014, Clean Harbors, October 2014.
46 Cameron-Cole. 2014b. Quarterly Groundwater Monitoring Report, 2nd Quarter 2014, Clean Harbors, July 2014.
47 Cameron-Cole. 2014a. Quarterly Groundwater Monitoring Report, 1st Quarter 2014, Clean Harbors, April 2014.

REBUTTAL: The dataset at issue, plotted below, indicates that, for the period of 2005-2019, only one TDS measurement of 2,400 mg/L was less than 3,000 mg/L TDS, and the other 55 measured results are greater than 3,000 mg/L. The single low measured value does not appear to be an accurate representation of the actual groundwater quality.



Moreover, a single data point or monitoring result cannot prove that the underlying aquifer is consistently less than 3,000 mg/L TDS, or that it did not meet one or more of the other exemption criteria in Res. No. 89-098. Common sense and due precaution would argue against designating water underneath the Clean Harbors hazardous waste facility as being suitable for beneficial use.

RTC Comment 10: Please see the response to comment No. 6 as this comment is addressed there.

REBUTTAL: See RTC Comment No. 6 Rebuttal.

RTC Comment 11: Valley Water proposed a model that does not appear to represent conditions beneath the site and does not appear to accurately identify observed data downgradient of the Facility. Valley Water used Modflow-Surface modeling for the study area and have provided results of a simulation. However, Board staff have not been provided the model nor have been provided a detailed list of assumptions upon which the model is based. Board staff were not involved in development of the model.

The model appears to:

- Depend on the subsurface sediments being homogeneous and isotropic;
- Apply only to the vadose zone which does not account for saturated flow;
- Depend on the process of specific retention of water that has adsorbed the massive amount of wastewater discharged historically at the facility (estimated at 60 billion gallons); and
- Assume that the sediments are dry prior to being impacted by wastewater.

The sediments are not homogeneous and isotropic as evidenced by the graphic logs presented on cross section A-A' and B-B' (Attachments 6.1 and 6.2). Staff's analysis of existing data indicate

1 that the plume of produced water has migrated into the regional aquifer at well CYM-21D1. Logs
2 of the boreholes presented by Valley Water indicate that much of the sediments ranged from
3 moist to wet when drilled, and therefore the process of specific retention would retain little of the
4 percolated water and much would flow out of the sediments as specific yield.

5 The results of a model run that staff were not involved with is presented as a figure on page 12 of
6 Valley Water's comments and included here as Attachment 5. It indicates that the wastewater has
7 reached wells CYM-17M1, CYM-17K1, and CYM-17Q1, but has not moved since the plume
8 reached these wells. In addition, Valley Water claims that impacts at well CYM-21D1 are caused
9 by migration of wastewater down the poorly constructed well, but the wastewater has not reached
10 the well CYM-21D1 according to the model. Board staff have consistently commented to Valley
11 Water that the model does not appear to be able to predict plume migration and does not appear to
12 be an accurate predictor of subsurface conditions.

13 **REBUTTAL:** Valley Water met with the Regional Board Staff on October 9, 2017 for an
14 approximately 3 hour workshop on an objective approach to developing the groundwater
15 flow model. Valley Water worked on the conceptual site model, model set up, and model
16 calibration, and then met with Staff (including the Executive Officer at the time, Pamela
17 Creedon) on January 10, 2018 for another 3-hour workshop on the preliminary results of
18 the groundwater model.

19 This discussion led to a request to modify the model, prepare a run showing the effects of
20 an additional 30 years of operation, and to re-evaluate the stratigraphy of the area in the
21 vicinity of the Clean Harbors facility, in particular the confining nature of the CCE at that
22 location, and perched water above the CCE at that location. Valley met again with Staff on
23 March 14, 2018 to discuss the model runs requested in the January meeting. During the
24 March meeting, the model was used to identify areas of agreement, and areas where further
25 data were needed to resolve areas of uncertainty. The use of the interim model was
26 successful, in that it identified locations for additional downgradient wells between
27 McKittrick and Clean Harbors. During the Regional Board meeting/workshop on April 5,
28 2018, the interim model results were again discussed with Board Members to highlight the
importance of the downgradient wells to resolve areas of uncertainty and then finalize the
groundwater model.

Valley Water agrees with Staff that the groundwater flow model needs to be further
constrained by the results of the downgradient wells. The model was developed in
consultation with Staff and was used in its present state to identify areas that require further
field evaluation. Once those wells are installed and data from them are available, Valley
Water intends to continue to work productively with Staff to complete the model and make
the model into a useful tool for decision-making at the site. The items mentioned in RTC
are all items that Valley Water anticipates discussing once more field data are available and
the model can be modified accordingly.

Valley Water acknowledges that the alluvium above the CCE appears to have formed in
an alluvial sand setting. In working collaboratively with Staff in development of the
groundwater model, we also agreed that sands may act as a preferential flow pathway, but
that these areas overlay the CCE and are within the alluvial deposits. The underlying
Upper Tulare Sands, however, differ from an alluvial fan because, in lacustrine

environments, geological formations tend to be more laterally continuous and more uniform than a fan setting.

RTC Comment 12: Board staff requested additional new downgradient monitoring wells in July 2014, and approved a work plan in early 2015. In March of 2015, Valley Water indicated that endangered species issues would make the construction of the wells more difficult. In April 2016, Valley Water submitted a cover letter and biological assessment report. The letter implied that one or two new wells (17H1 and well 17H2) would be drilled soon, but the other two wells CYM-19H2 and CYM-21D2 would be installed later due to the proposed locations being in an area associated with endangered species habitat. To date, not much new data has been provided to Board staff other than an additional set of samples from a small number of Clean Harbors monitoring wells and the routine monitoring of the Valley Water wells.

Board staff understands that siting wells in areas associated with endangered species can be difficult, and at every opportunity has encouraged Valley Water to pursue already-disturbed locations, such as farmed areas, county rights-of-way, etc. However, after a certain point it is unreasonable to continue to leave significant questions unanswered while a discharge that is likely affecting beneficial uses remains ongoing.

REBUTTAL: Although Staff tries to make Valley Water sound recalcitrant and uncooperative, the fact is that Valley Water has cooperated with the Regional Board since 2000 to assess the potential impact of the produced water ponds on underlying groundwater. The following brief chronology of actions demonstrates Valley Water's commitment to compliance, collaboration with the Regional Board, and ensuring that the discharge to the unsaturated zone beneath the McKittrick Ponds does not impact the deeper groundwater present in the area or existing beneficial uses.

2000: After discussions with Staff in the late 1990s, Valley Water voluntarily had a surface geophysical survey done to attempt to identify produced water migration beneath the McKittrick Ponds (Strata Geophysical, 2000).

2001-2004: Discussions with Staff resulted in Valley Water agreeing to voluntarily install and sample three monitoring wells as part of a Phase 1 Hydrogeologic Characterization Investigation (Geomega, 2004). As a result, groundwater samples were collected and analyzed in 2002 and 2003 even without a monitoring and reporting program ("MRP") or other order being in place.

2006-2007: In 2006, Valley Water voluntarily submitted a monitoring well installation work plan ("MWISP"), installed and sampled three additional monitoring wells, and reported the results in the Phase 2 Hydrogeologic Characterization Report (Geomega, 2007).

2012-2018: Valley Water voluntarily conducted semi-annual monitoring, sampling, and analysis of the 6 wells and reported the results to the Regional Board, all in the absence of an MRP or other order.

2014: Staff convened meetings with Valley Water and consultants to assess the available data and determine next steps. Valley Water voluntarily met with Staff on several occasions in May, July, August, and October of 2014 to provide data and information and to discuss the proposed monitoring well installation work plan. A Phase 3 Monitoring Well Installation Work Plan was submitted in November 2014.

Before the Work Plan was approved by Staff, Valley Water immediately contracted with a

1 biological consultant (South Valley Biology) to begin habitat observations and animal
2 species surveys of the proposed well locations. The consultant provided a reconnaissance-
3 level study of the area in December of 2014, which was provided to Staff (South Valley
Biology, 2014).

4 **2015:** Following technical discussions with Staff, a Modified MWISP was
approved on 22 January 2015.

5 South Valley Biology provided a map of potentially acceptable well site locations in March
6 2015, then performed biological surveys in May, June, and July of 2015. This investigation
7 also indicated that the locations of existing wells that were selected as additional shallow or
deep monitoring wells since some locations might not be available because of current
biological activity or species presence.

8 In order to perform complete Blunt Nosed Leopard Lizard (“BNLL”) protocol biological
9 surveys, the surveys must be conducted in two phases. The initial phase is a survey for
mature BNLLs beginning April 15th. The second phase is a survey for juvenile BNLLs,
10 which begins in late July. These surveys must be completed consecutively and if either of
the surveys are missed, then they must be performed in full the following year. No well
11 installation work can be permitted prior to the completion of the surveys and acceptance of
the reported results by the appropriate regulatory agencies. The initial surveys may not be
12 sufficient and follow up surveys are often required, which adds more time to the schedule.
Due to the extensive manpower required for these surveys, and the demand for this type of
13 service, BNLL surveys are scheduled months prior to the April 15th start date.

14 **2016: January 29th** - South Valley Biology provided a complete biological report
15 summarizing the special-status plant surveys and focused surveys for the BNLL that were
completed. This habitat evaluation completed in early 2016 did not identify specific well
16 locations that could be used, but did identify the species that had to be addressed as factors
that could restrict the available land for drilling:

- 17 • **Kern Mallow**, a federally listed plant is ubiquitous – so the only alternatives are to
18 find areas sufficiently disturbed to have no vegetation growth or work with agencies and
the Kern Water Bank to receive incidental take permitting through the Kern Water Bank
19 Master Permit.
- 20 • **Blunt Nosed Leopard Lizard** – despite not having sited BNLLs during field work,
BNLL habitat - presence of burrows – must be protected.
- 21 • **Nelson’s Antelope Squirrel** – this state listed species occurs in the area so all areas
22 with burrows (plus a 50-foot buffer) must be protected. State listed species are not eligible
for Kern Water Bank incidental take permitting.

23 The report also indicated that the locations of existing wells that were selected as additional
24 shallow or deep monitoring locations might not be available because of current biological
activity or presence. The conclusion of this report was that it will be difficult to find
25 drilling locations. In an attempt to keep the drilling process moving forward, Valley Water
engaged another biological consultant to get a second opinion.

26 In February of 2016, additional monitoring well locations were identified. Following
27 evaluation of the new sites, Valley Water concluded that new locations with less habitat
constraints could only be found of Clean Harbors’ property.

1 **February 9th** – Based on Jim Jones’ extensive field surveys, it was recommended
2 that Valley Water not access the original well locations as that area is occupied by
3 numerous species and it did not appear that the wells could not be drilled without direct
4 impacts to protected species habitat. The biologist confirmed two down-dip locations that
5 might work.

6 **February 10th-** Well locations were to be determined and then the work plan
7 would be updated.

8 **March 9th-** Andrea with SWS informed Valley Water that SWS needed to review
9 MWISP.

10 **April 12th-** Valley Water worked with Jim Waldron and Kennedy Jenks to locate
11 new well locations. After extensive examination, it was determined that location needed to
12 be on land owned by Clean Harbors.

13 **May 10th-** Jim Waldron contacted Clean Harbors and asked for a meeting to
14 discuss wells on their property.

15 **June 15th-** Valley Water had a meeting with Jim Waldron and representatives of
16 Clean Harbors.

17 **June 26th** - The Regional Board provided an administrative draft Monitoring and
18 Reporting Program to Valley Water for review.

19 **June 30th-** Jim followed up with an email asking David Nielsen of Clean harbors
20 whether and when they would grant permission to drill on their property. David Nielsen
21 requested Valley Water’s attorneys draft a legal document for review.

22 **July 25th-** Jim Waldron followed up with David Nielson. No progress.

23 **November 17th-** Jim was told that Clean Harbors had not had time to address
24 requests.

25 As shown above, during 2016, Valley Water approached Clean Harbors to discuss use of
26 their wells or lands for developing an expanded groundwater monitoring program. This
27 effort was largely unsuccessful until Staff became involved in the discussions in 2017 as
28 shown below.

2017:

February 3rd- Jim Waldron spoke with Clay Rodgers, who promised to contact
Clean Harbors.

March 23rd- Valley Water sent a letter sent to Clay Rodgers formally requesting
help with Clean Harbors.

May 4th - Valley Water received an email from Ron Holcomb, Regional Board
Staff asking Valley Water to take samples of Clean Harbors monitoring wells and
incorporate data into a 2017 semi-annual report, even in the absence of a MRP. At this
point, Staff seemed to understand Valley Water’s difficulty is finding potential drill sites
and appeared to be accepting of testing at Clean Harbors while working through well
location issues.

2018:

March 9th - Valley Water submitted a response to the Regional Board letter on the

1 proposed MRP, raising many of the same issues that will be discussed in the upcoming
2 CDO hearing. (See Exhibit 27.) As a result, a new version of the MRP was provided on 22
3 March, 2018.

4 **March 14th-** Meeting with Clay Rodgers to discuss the technical issues as to
5 drilling wells.

6 **April 4th -** McKittrick 1 & 1-3 were issued a Monitoring and Reporting Program
7 (MRP).

8 **June 4th-** Chris Reedy submitted Valley Water's Monitoring Well Installation and
9 Sampling Plan (MWISP) in accordance with the newly issued MRP.

10 **June 11th-** Chris Reedy called the Regional Board Staff to request comments on
11 the submitted MWISP.

12 **July 9th-** Valley Water receives a request for a meeting with Regional Board Staff
13 scheduled for July 31. Valley Water responds with a request for specific comments as to
14 insure all that needed to be in attendance would be able to make it. Regional Board Staff
15 responded that they had not done a detailed review of Valley Water's plan and only
16 provided brief and vague comments.

17 **July 30th-** Valley Water receives a 27 July 2018 comment letter from Staff. Given
18 the late timing of these comments, Valley Water opted to cancel the July 31 meeting and
19 provide a written response to comments. Staff gave Valley Water until August 27 to submit
20 a revised MWISP.

21 **August 27th-** A revised MWISP was submitted to Staff to address comments
22 submitted by the Staff on the original MWISP. Valley Water has no fundamental
23 disagreements with the July 30 comment letter. The species and other issues are beyond
24 Valley Water's reasonable control.

25 **September 17th-** Valley Water received a 13267 Order dated September 13, which
26 detailed a time schedule of what Valley Water was required to do and giving conditional
27 approval to the revised MWISP. The letter falsely states that Valley Water had an
28 "apparent refusal" to drill CYM-17A1, even after the MWISP specifically mentions the
drilling of that well. Received comments from Staff on MW installation and sample plan.
Regional Board Staff stated that Valley Water was taking too long to complete the wells.

The point of providing this detailed chronology is to demonstrate Valley Water's diligent
work on **voluntary** compliance and Phase 3 well siting from 2000 to 2018 when the
Regional Board moved from voluntary compliance to enforcement. Delay in the
implementation of the MWISP has been due to addressing thorny and time-consuming
species issues, attempting to get data and well drilling access from Clean Harbors, which
was only accomplished once Staff pressure was applied, and negotiating access and drilling
agreements with private property owners, over which Valley Water has no control or
leverage.

Valley Water has provided monthly reports to Staff regarding Valley Water's efforts to
obtain permits and agreements to install the downgradient wells. (See e.g., Exhibits 28 and
30.) Valley Water's response to the CDO provided further information regarding
diligently proceeding with approvals for work within the area of the fully-protected Blunt

1 Nosed Leopard Lizard. As stated in its initial submittal on April 8th and Objections on
2 May 16th, Valley contends that this CDO hearing is premature pending the results of these
3 wells, because the data may assist to fill in current gaps and determine the appropriate
4 regulatory path going forward.

5 However, as the following chronology of events in 2019 occurring since Valley Water's
6 April 8th submittal demonstrate, Valley Water cannot control the timing of drilling the
7 needed wells:²

8 **April 9th** – Valley Water met with Tyler Tilbury, Valley Water's Landman
9 (private consultant), who was working on the access agreements with the Abbott family,
10 Houchin, and Chevron to install proposed monitoring wells.

11 **April 12th** - Valley Water put Chevron on notice via email of continuing BNLL
12 surveys on their property through the summer. Valley Water sent the Regional Board staff
13 a monthly report on the progress that Valley is making towards installing the proposed
14 monitoring wells (see Exhibit 28).

15 **April 15th** - Valley Water confirmed with McCormick Biological via email that
16 the BNLL surveys were starting. Valley was informed that while the season had started
17 the environmental parameters of the survey had not been met yet.

18 **April 22nd** – Received a letter from Aqua Terra Aeris Law Group regarding a
19 notice of violation and a notice of intent to sue Valley Water for an alleged Proposition 65
20 violation, which created a distraction of resources for Valley Water.

21 **April 23rd** – Valley Water asked via email for a status update on the Small
22 Mammal Trapping and Plant Survey reports. McCormick stated the reports were "in
23 progress."

24 **April 25th** - Valley Water asked its biological consultant McCormick via email
25 for a status update on the Small Mammal Trapping and Plant Survey reports.

26 **April 26th** – McCormick responded via email to the April 25th correspondence
27 indicating that the reports would be complete by April 29th.

28 **April 30th** – Valley Water called McCormick asking for a status update on the
Small Mammal Trapping and Plant Survey reports. McCormick indicated that they were
assigning additional manpower to the reports and receipt should be expected by the end of
the week.

May 3rd – Received the trapping results for the Cymric Water Monitoring Well
Network Expansion Project prepared by McCormick. This report was necessary to
proceed with finalizing the agreements with Chevron and also to be able to access the
Houchin well location. The trapping sessions had occurred between March 25th and
March 29th.

May 7th – Valley Water had a conference call with Clay Rogers and Staff
regarding the proposed monitoring well locations. On this date, Valley Water also had an
internal meeting to discuss permitting for wells and discussed that the lead time for
permits was about two weeks. A well permit with Kern County was also needed, which
would take a day or so. At this meeting, Valley Water also discussed calling Tyler

² Valley Water's designated witnesses can testify to the truth of these allegations and answer questions about the same.

1 Tilbury to get status of well location agreements, and calling Terry Enders (Valley Water
2 Board member from Chevron) to see if he could assist with the Chevron agreements.

3 **May 10th** – Valley Water sent Regional Board Staff a monthly report on the
4 progress that Valley is making towards installing the proposed monitoring wells. (See
5 attached email at Exhibit 30.)

6 **May 13th** – Valley Water received Staff's RTC responding to Valley Water's
7 comment letter sent on April 8th.

8 **May 14th** – Valley Water had a meeting with Valley Water staff, legal, and
9 consultants about rebuttal to the Staff's RTC, which was due on May 20th.

10 **May 15th** – Jason Meadors talked to Terry Enders to see if he has a contact with
11 Houchin to see if we could push the access agreement along, since Tyler has not heard
12 from Houchin, and discussed status of assistance with the Chevron agreements.

13 **May 16th** – Jason Meadors reached out to three different Houchin family
14 members to try and get an updated status on the agreement. Steve Houchin committed to
15 bringing up the agreement in a meeting to be held on the same day within his company.
16 On this date, Valley Water received draft agreements from Chevron to install monitoring
17 wells on their property. Valley Water's legal reviews agreements and Valley sends minor
18 comments back to Chevron for finalization.

19 **May 17th** – Tyler Tilbury spoke with Donald Houchin and Mr. Houchin said that
20 they still had not visited the property, but wanted to do that before signing the agreement.
21 Mr. Houchin acknowledged that he had received a call from Jason Meadors and that Mr.
22 Houchin and Mr. Tilbury were planning on meeting on Wednesday, May 22nd to discuss
23 the draft agreement after Mr. Houchin had visited the site.

24 **May 20th** – Jason Meadors left a message with Steve Houchin to check on the
25 status of the agreement, per their discussion the previous week.

26 If Valley Water owned the property around McKittrick and had no endangered species
27 issues to address, Staff's irritation with the time delay would be warranted. However, Staff
28 has been aware of these issues for some time,³ and has been receiving monthly status
reports on the progress being made and the various stumbling blocks impeding faster
progress.

RTC Comment 13: For Valley Water to consider moving this highly saline wastewater to
another pond Facility, Valley Water needs to first demonstrate that the receiving Facility is

³ See Exhibit 29, Memorandum dated July 27, 2018 from Alejandra Lopez, Engineering Geologist, to Ronald E. Holcomb, Senior Engineering Geologist. (GEOT_0059) The memorandum was attached to a letter dated July 27, 2018 from the Regional Board to Russell Emerson at Valley Water to inform him of the Staff's comments on the MWISP for McKittrick prepared by Kennedy/Jenks Consultants, which was submitted by Valley Water in response to the requirements of MRP Order R5-2018-0808. In the "background" portion of the memo, Ms. Lopez acknowledges the challenges presented by endangered species to the process of installing monitoring wells:

"Proposed monitoring well locations are tentative and may be moved based on a future habitat survey evaluation by a biologist.... **Due to the confirmed presence of federally listed endangered species, this process may take a long time and, if the Blunt Nose Leopard Lizard is found in the area, then no incidental take will be allowed and access for drilling will not be granted.**" (Emphasis added).

1 appropriately located in a zone where it will not affect the beneficial uses of groundwater. The
2 nearby McKittrick Facilities are in the same geologic setting of channelized alluvial fans and
relocating the discharge to these areas could create the same issues as we have at the Facility.

3 **REBUTTAL:** The idea of moving the produced water elsewhere was not a proposal, just
4 an example to show the difficulty of ceasing discharge at McKittrick. Valley Water is not
5 currently proposing to move the discharge to another facility; therefore, the demonstration
of another appropriate location is premature.

6 **RTC Comment 14:** According to a conversation with a Clean Harbors representative, the small
7 pond is not currently used as an impoundment. In the late 1980's or early 1990's, a biological
8 assessment was completed for the Clean Harbors facility and a wetlands area was required to be
9 maintained. The previous owners of the Clean Harbors facility were required to keep clean water
10 in this pond as part of the wetlands until tules were established. Clean Harbors is not required to,
and does not currently, maintain or use this pond. The pond is lined with compacted native soil
and with a PVC liner. Given that the pond is lined, it is unlikely that it contributes significant
recharge to the groundwater beneath the Clean Harbors facility. The density and types of
vegetation in this pond are similar to what is observed in undisturbed land between the Valley
Water Facility and the Clean Harbors Facility.

11 **REBUTTAL:** As stated in Valley Water's May 16th Objections, this RTC should be
12 stricken as hearsay because no declaration was submitted to support these facts, and no
13 witness from Clean Harbors was designated to support these Staff allegations.

14 **RTC Comment 15:** Valley Water provides no analytical data or information to confirm its
15 allegations, and it is unclear to Board staff inspectors that what is shown in the pictures is oil.
16 There are several other possibilities, including but not limited to, compost, manure, gypsum,
17 herbicides, etc. Aerial photographs show that the dark areas are present on every other row of
18 trees. This is consistent with how many farmers apply soil amendments in that they alternate
19 rows. Further, if it was related to irrigation, these field [sic] are believed to be irrigated by drip
and micro-sprinkler irrigation that would present a different pattern of staining. If groundwater
mixed with oil was discharged to the ponds, staining should include concentric rings and the
bottoms should be stained as the oil would float on the water surface and coat the bottom as the
water level receded. In the pictures provided by Valley Water, the staining is not ringed, but
rather has an irregular pattern and the staining appears to extend beyond the pond surface. Starrh
Farms is currently using the groundwater for its designated AGR beneficial use.

20 **REBUTTAL:** Valley Water staff has personally observed oil from the Starrh wells at the
21 surface and one of Valley Water's designated fact witnesses can testify at the hearing
22 about this fact. The pictures submitted on April 8th by Valley Water are merely
23 photographic evidence of what the individuals observed directly. The oil is not simply an
24 interpretation of an aerial photograph. (See Staff's Attachment B, showing farmland lies
25 within Administrative Boundaries for the Belridge South Oil Field.) More important than
26 the presence of oil in the Starrh wells, however, is the fact that the Starrh Farms irrigation
27 wells have drawn in that percolated produced water from another facility to the north
28 (Aera or other northern area ponds, not the McKittrick Ponds), that causes the
groundwater to have higher TDS concentrations along with high chloride and sodium
levels. This water, with characteristics of produced water, has been blended with surface
water supplies and applied to crops immediately north of MW-148I intermittently since
2003. Percolation beneath these fields would therefore have characteristics of both
produced water and agricultural runoff, and would percolate downwards to the perched

1 zone above the CCE beneath Clean Harbors, representing a more likely contribution than
2 McKittrick, yet not acknowledged or discussed by Staff.

3 **RTC Comment 16:** Staff generally agree that the 2002 sample point for CYM-21D1 may not
4 have been representative of the Regional Aquifer. However, no sampling occurred from 11/2002
5 (TDS 1200 mg/L) through 9/2006 (3200 mg/L). Since 2006, CYM-21D1 TDS concentrations
6 have been increasing to 10,000 mg/L in 2018 and it is entirely possible that during the time
7 between the 2002 sampling event and the 2006 sampling event TDS concentrations might have
8 been below 3000 mg/L. Unfortunately, Board staff could not locate additional data such as how
9 much water was added during development and how much was removed. Board staff has
10 reviewed the Monitoring Well Construction Log provided by Valley Water and it indicates
11 centralizers were located every 50 during construction. Nonetheless, the obligation was upon
12 Valley Water to install and develop the well such that a representative groundwater sample of the
13 intended water-bearing zone could be collected. If the sample was not representative, additional
14 development should have been completed and Valley Water should not have waited four years to
15 collect the next sample. In addition, the almost four-year gap in sampling would have provided
16 data that would have allowed more than speculation on Valley Water's part that groundwater had
17 a TDS concentration greater than 3,000 mg/L in 2002 when the only available sample says
18 otherwise.

11 Valley Water has known that CYM-21D1 has been increasing in produced wastewater chemical
12 concentrations and failed to install additional monitoring wells in the regional aquifer. Valley
13 Water failed to address purported well integrity issues with CYM-21D1 that it claims provides a
14 pathway for wastewater to enter the regional aquifer. Valley Water also leans heavily on the
15 hydrogeologic modelling that they have historically claimed indicates that the plume is not near
16 well CYM-21D1.

15 **REBUTTAL:** Valley Water noted concerns related to sampling from CYM-21D1, and
16 summarized those concerns in its response to the CDO.

16 Staff's contention that McKittrick has been influencing CYM-21D1 since 2006 are
17 rebutted by other evidence, including a report dated 19 August 2009 (*See Exhibit 23*
18 *PHASE II HYDROGEOLOGIC CHARACTERIZATION REPORT – VALLEY WASTE*
19 *DISPOSAL COMPANY- CYMRIC FIELD STUDY AREA KERN COUNTY. Letter*
20 *from S.R. Gray and J.K. Dowdall to Larry Bright, Valley Waste Management Company.*
21 *19 August 2009.*) This report noted that the available data shows that produced water from
22 McKittrick had not moved far enough to reach well CYM-21D1 (*see Exhibit 23, page 1,*
23 *item (3); see also page 4, last paragraph ("Analytical data from the September 2006*
24 *sampling event at well CYM-21 D1 shows that concentrations of TDS, boron, and*
25 *chloride have increased since the November 2002 sampling event. However, the 2006*
26 *groundwater analytical data is consistent with downgradient background groundwater*
27 *monitoring well (MW) MW-102RL at the Clean Harbors Buttonwillow Facility. It appears*
28 *that well CYM-21D1 may not have been sufficiently developed during the initial 2002*
sampling event resulting in lower constituent concentrations due to dilution. The 2006
sampling results appear to be more representative of background groundwater quality.")).
Therefore, the apparent change in water quality for the 2006 sampling event was not due
to an impact of produced water from McKittrick, but instead the water quality measured at
CYM-21D1 had returned to the background groundwater quality levels for the
groundwater in the Lower Tulare Sands.

As Staff is aware, Valley Water plans to install a well to augment and replace CYM-21D1

1 this year, and findings from the geology and water quality at that well will inform this
2 discussion. The groundwater model, as currently configured, models groundwater flow in
3 the Upper Tulare Sands. Therefore, the model was not constrained by information from
CYM-21D1, which was installed to sample water from the Lower Tulare Sands.

4 **RTC Comment 17:** As mentioned previously, groundwater elevation is a response to water
5 being recharged to the water-bearing zone (i.e., aquifer) and discharge or water being removed. In
6 this area, the only apparent discharge or water being removed from the aquifer would be by wells
7 that are pumping leading to migration of groundwater downgradient towards those wells. The
primary pumping in the area is by agricultural wells pumping water for irrigation. The declining
water levels indicate that this water is within the influence of those wells and is being withdrawn
faster than it is being recharged.

8 The chemical data indicate that at least part of the recharge component is produced water. The
9 Board is concerned about water in the zone above Valley Water's monitoring wells, which would
10 indicate potential lateral migration in the upper zone, above the CCE perching layer. Monitoring
of this shallower zone is needed to answer this question.

11 **REBUTTAL:** As mentioned in the Valley Water's Rebuttal to comment 7, the borehole
12 log comments did not indicate saturated conditions. Nevertheless, Valley Water proposes
to assess soil moisture conditions at the depth of the CCE during drilling and borehole
logging to install deeper wells.

13 Monitoring conducted to date demonstrates that the CCE may pass water downwards to the
14 Upper Tulare Clay; and validation of the groundwater model indicates that all of the water
15 percolated from the ponds can be accounted for through evaporation and within the Upper
16 Tulare Sands. Monitoring conducted to date also demonstrates that, beneath the Clean
17 Harbors Facility, the CCE does act as a perching layer, forming a zone of shallow
18 groundwater beneath Clean Harbors that is not observed beneath McKittrick (where the
19 wells demonstrate flow through the CCE). At some point between McKittrick and Clean
20 Harbors, the CCE transitions from allowing flow-through (McKittrick) to impeding flow to
21 the extent a perched zone forms (Clean Harbors). Valley anticipates working with Staff to
accommodate this possibility in the groundwater flow model. However, Valley Water does
not believe the exact location of this transition is relevant to considering potential
downgradient effects to beneficial uses because the Lower Tulare Sands, although of poor
water quality, is the only zone at issue. Further, if groundwater is truly perched, and there
is no pumping from it, then the declining water levels cannot be due to pumping.

22 **RTC Comment 18:** What Valley Water is referring to as produced water fingerprint refers to
23 groundwater consisting entirely or almost entirely of oil field produced wastewater. Most of
24 Valley Water's monitoring wells appear to consist entirely of percolated wastewater, while
25 monitoring wells at Clean Harbors appear to contain a mixture of produced water and other
sources. Board staff believe the increase in the produced water component is observed by
continued change in water quality as more produced water mixes in Clean Harbors monitoring
wells.

26 **REBUTTAL:** Valley Water's April 8th response to the CDO presented an extensive
27 analysis of the water quality in the alluvial zone beneath Clean Harbors, and compared that
28 poor water quality (which cannot be from McKittrick owing to the permeable CCE beneath
McKittrick) with water quality in the next two deeper water bearing zones at Clean

1 Harbors. The characteristics of the alluvial perched water at Clean Harbors explains all of
2 the observed trends in the lower two aquifers, and does not require a fingerprint from
3 McKittrick for explanation. Furthermore, the degradation of the perched zone above the
4 CCE beneath Clean Harbors is likely came from Starrh wells groundwater that has been
historically affected by produced water from the Aera or other northern produced water
site.

5 **RTC Comment 19:** Boron is increasing in MW-148I as shown in Staff Report Attachment J.1
6 (updated to include 1Q2019 data and included as Attachment 4.3 in this document). Boron
7 concentrations in MW-148I have increased from 5.3 mg/L in 3Q2016 to 11 mg/L in 1Q2019.
8 Increasing concentrations of boron are usually observed after increases in TDS and chloride have
9 been observed. Board staff believe that boron increases did not begin at the same time because
10 boron is retarded during wastewater migration through the sediments. In other words, as the
11 wastewater plume migrates, boron is adsorbed onto clays and its progress through the aquifer is
12 slowed.

13 **REBUTTAL:** In Valley Water's response to the CDO, an extensive analysis of the water
14 quality in the alluvial zone beneath Clean Harbors was presented, which included boron.
15 Valley Water compared that poor water quality (which cannot be from McKittrick owing
16 to the permeable CCE beneath McKittrick) with water quality in the next two deeper water
17 bearing zones at Clean Harbors including MW-148I. As stated in the Rebuttal to RTC
18 Comment 18, the characteristics of the alluvial perched water at Clean Harbors explains all
19 of the observed trends in the lower two aquifers, and does not require a fingerprint from
20 McKittrick for explanation. Furthermore, some of the water that leads to degradation of the
21 perched zone above the CCE beneath Clean Harbors may be from the Aera or other
22 northern area produced water ponds (not McKittrick) that have affected the Starrh wells. In
23 addition, the historic water quality data on the Geotracker site included as Exhibit 25
24 demonstrates that high boron levels appear to be naturally occurring and in many places at
25 too high to support agricultural (AGR) uses.

26 **RTC Comment 20:** Produced wastewater in the Facility ponds contains an ammonium
27 concentration of 110 mg/L. This is consistent with recent studies published by the USGS
28 (Regional Patterns in the Geochemistry of Oil-field Water, Southern San Joaquin Valley,
California, USA; Applied Geochemistry 98 (2018) 127-140). If this amount of ammonium is
converted to nitrate while in the ponds, there would be 374 mg/L of nitrate and 83 mg/L of nitrate
as N. These concentrations are greater than the nitrate observed in MW-148I and demonstrate that
it is possible for the nitrate observed in MW-148I to have come from the Valley Water Facility
discharge.

29 **REBUTTAL:** Valley Water acknowledges a data gap related to nitrogen compounds
30 between the McKittrick facility and the Clean Harbors facility. Water quality sampling of
31 the new wells is anticipated to help resolve this comment and provides another reason why
32 delay of the CDO hearing is warranted.

33 **RTC Comment 21:** Attachment K has been revised to include first quarter 2019 data and
34 included here as Attachment 2.2. Attachment 2.1 shows data just from the Clean Harbors wells.
35 Attachments 2.1 and 2.2 show that some pond wastewater samples plot relatively close to MW-
36 148I. Clean Harbors MW-148I isotopic signature has moved from its 2017 reported
37 concentrations towards containing a larger fraction of produced wastewater in 2019 along the
38 same pattern as CYM-21D1 plotted historically. There are multiple lines of evidence which
includes oxygen-18 and deuterium isotope signature, increasing trends of TDS, chloride, and

1 boron concentrations that support that CYM-148I is being influenced by produced water (most
2 likely Valley Water Facility wastewater). Board staff is not aware of any other potential source.
3 Board staff's interpretation is that groundwater beneath the Clean Harbors Facility is being
4 impacted by produced water and not that the groundwater is composed entirely of produced
5 water. Therefore, we would not expect the groundwater beneath the Clean Harbors facility to look
6 exactly like produced wastewater or to plot in the field of the oilfield produced water ponds.

7 **REBUTTAL:** Staff's statement that "CYM-148i is being influenced by produced water
8 (most likely Valley Water Facility wastewater)" has several issues. First, there is no
9 CYM-148I well. MW-148I is a Clean Harbors intermediate zone well. Second, Staff's
10 statement indicates that the Staff was aware of other possibilities, such as those associated
11 with Starrh Farms irrigation and the northern (e.g., Aera) produced water facility
12 influences. As discussed above, Starrh Farms irrigation uses water that contained
13 produced water from another source besides McKittrick. Valley Water's response to the
14 CDO presented extensive analysis of these data, including identification of other sources
15 of water quality impairments observed beneath the Clean Harbors facility at MW-148I.

16 **RTC Comment 22:** Naturally occurring groundwater in this area is a sulfate type. However,
17 water in MW-148I, MW-102RL, and MW-149RI from 2017 and 2019 as observed in the Piper
18 diagram on Attachment 3 shows that wells have become more chloride enriched and appear to be
19 moving towards a mixture of increasing amounts of wastewater. Well MW-170L only has one
20 sample data point as it was reported to have become dry during the 2019 sampling event.

21 **REBUTTAL:** In Valley Water's response to the CDO, Valley Water presented an
22 extensive analysis of the water quality in the alluvial zone beneath Clean Harbors, and
23 compared that poor water quality (which cannot be from McKittrick owing to the
24 permeable CCE beneath McKittrick) with water quality in the next two deeper water
25 bearing zones at Clean Harbors including MW-148I. All of the observed trends in the
26 lower two aquifers can be explained by the characteristics of the alluvial perched water at
27 Clean Harbors, and does not require pointing to McKittrick as a source. Furthermore,
28 some of the water that leads to degradation of the perched zone above the CCE beneath
Clean Harbors likely emanates from the northern produced water ponds (e.g., Aera or
others) that have affected the Starrh wells.

RTC Comment 23: Attachment J.2 has been modified to include a boron concentration graph
and presented as for TDS, chloride, sulfate, and boron on Attachments 4.1, 4.2, 4.3, and 4.4 in this
document. In 2012-2013, Valley Water does not state why it believes that these trends are not
consistent with produced wastewater influence in MW-102RL. When Board staff reviewed the
data, our interpretation was that the increases in TDS, chloride, and boron are consistent with
what we would expect with produced water impacts. There are issues with TDS because it is the
sum of the different cations and anions and increases in an individual constituent may not be
reflected in TDS if there is a reduction in a different constituent. Boron as described earlier in this
document is subject to adsorption by the sediments and increases may be delayed when compared
to other constituents that are not subject to adsorption.

REBUTTAL: See Valley Water's Rebuttal to RTC Comment 19.

RTC Comment 24: Valley Water refers to corresponding increases to mean that the increases
seen in Clean Harbor's wells MW-102RL and MW-170L are less than the increases seen in
CYM-21D1. Board staff does not believe that Clean Harbors wells MW-102RL and MW-170L

are impacted by wastewater to the same degree that Valley Water well CYM-21D1 is. Board staff do not see clear evidence of impact trends at Clean Harbors well MW-170L or MW-PRL. As expected, impacts are observed in MW-102RL because it is closest to the potential wastewater source. Total dissolved solids, chloride, boron, and sulfate time concentrations charts for select Clean Harbors wells are presented as Attachments 4.1, 4.2, 4.3, and 4.4 and include 2019 analytical data. Figures on pages 22 and 23 of the comment letter presented only low concentrations and excluded high concentrations reported for Clean Harbors wells MW-102RL and MW-170L.

REBUTTAL: See Valley Water's Rebuttal to RTC Comment 22.

RTC Comment 25: The boring log for well CYM-17K1 noted wet coarse-grained material (sand/gravel) above the CCE. Valley Water failed to collect a sample from this wet zone and does not have any monitoring wells screened above the CCE, thus additional monitoring wells screened above the CCE are needed to address this data gap.

REBUTTAL: See Valley Water's Rebuttal to RTC Comment 17.

RTC Comment 26: The groundwater beneath Clean Harbors is a sulfate type water. However, in the wells that Board staff believe are impacted by produced water, the groundwater is becoming enriched in chloride. Time concentration graphs for chloride in groundwater from wells CYM-21D1, MW-148I, and MW-102RL are presented in Attachment 4.2. Produced wastewater in the Facility ponds contains an ammonium concentration of 110 mg/L. As discussed previously, if this ammonium is converted to nitrate while in the ponds or while migrating beneath the ponds, this conversion would produce 374 mg/L of nitrate and 83 mg/L of nitrate as N and these concentrations would address the nitrate observed in MW-148I. It is possible for all the nitrate observed in MW-148I to have come from the Valley Water Facility discharge.

As addressed in an earlier response to a comment, high concentrations of nitrate have been observed in westside groundwater outside of the influence of agricultural activities and is presented as Attachment 10.

REBUTTAL: See Valley Water's Rebuttal to RTC Comments 19 and 22.

RTC Comment 27: The Facility and its monitoring network are located on alluvial fan deposits that characteristically contain channel deposits that act as preferential pathways, allowing groundwater to move relatively quickly laterally and downgradient. Valley Water does not have any monitoring wells screened above the CCE, so there are no data to support the idea that there is no groundwater in the upper alluvium. It is possible for channels to cut through the CCE and it is also possible that the CCE is discontinuous between Valley Water wells and Clean Harbors wells. The groundwater beneath Clean Harbors is lower in elevation, including the upper perched zone, when compared to CYM-17K1. If the CCE is discontinuous, it could allow the wastewater plume to pass through the CCE and to mix with the water in the upper perched zone and with the water in the intermediate perched zone beneath Clean Harbors. The boring log for CYM-17K1 noted wet coarse-grained soils (primarily sand) above the CCE in 2007 when it was being drilled. Well CYM-148I is the second water-bearing zone at the Clean Harbors facility and any impact in the Clean Harbors upgradient wells would have to go through that upper perching layer and migrate upgradient, seems unlikely.

REBUTTAL: For some reason, Staff appears to believe that the CCE is discontinuous and permeable at and near Well CYM-17K1 and does not form a restrictive layer, but the upper perched layer at MW-148I is apparently continuous and relatively impermeable. Staff's reasoning is unclear and not supported by evidence. As noted in the Rebuttal to RTC Comment 7 above, Staff apparently assumed that the occasional use of the word

1 'wet' in the boring logs for Valley Water's monitoring wells means that significant
2 saturated conditions were observed. However, there is no direct indication of saturated
3 soil conditions or perched groundwater on the boring logs. *See also* Valley Water's
4 Rebuttal to RTC Comment 17.

5 **RTC Comment 28:** Regarding item 1, Valley Water provided no evidence demonstrating that
6 there was no groundwater beneath the Facility prior to the initiation of its discharge. While
7 Finding 29 of the tentative CDO demonstrates that the produced wastewater discharged to the
8 Facility ponds does have elevated levels of several constituents vastly above the MCLs (see
9 Tentative CDO, Finding 29.), that is not the focus of the impacts and staff is not applying the
10 MCLs to "first encountered groundwater." Rather, the CDO and staff report note that the resulting
11 groundwater plume from the produced wastewater discharge exceed by orders of magnitude for
12 several constituents the quality necessary to maintain the designated beneficial uses, and in the
13 case of AGR, the existing beneficial uses of groundwater downgradient of the Facility. (See
14 Tentative CDO, Findings 29-33, 37; Staff Report pp. 2, 9-10, 16-18.) The Basin Plan designated
15 beneficial uses of groundwater in the area are municipal and domestic supply (MUN), agricultural
16 supply (AGR), and industrial service supply (IND). The CDO and Staff Report goes on to point
17 out that it is the opinion of Board staff that the plume is causing impacts to these beneficial uses
18 off-site and downgradient of the Facility.

19 The idea implicit in Valley Water's supposition that it is ok to discharge its poor-quality water
20 into water that is suitable for beneficial use until the median threshold concentration for a given
21 criteria is exceeded for the entire groundwater basin is contrary to the Boards mission to protect
22 designated beneficial uses.

23 Regarding item No. 2, Valley Water states that the Board staff has not presented evidence as to
24 whether the discharge has caused and exceedance of the Basin Plan's average annual increase EC
25 limits. The statement is not incorrect. The CDO and Staff Report do not allege that Valley
26 Water's discharges have increased the EC across the entire basin and, therefore, caused
27 exceedances of the Basin Plan incremental limits. As explained above, the tentative CDO and
28 Staff Report do allege that the that the discharge is causing exceedances of water quality
objectives off-site and downgradient which is sufficient to demonstrate a discharge of waste in
violation of the Basin Plan.

Regarding item No. 3, this Board adopted into the Basin Plan effluent limits for oil field
discharges to land to protect groundwater. These limits state that the EC of the discharge shall not
exceed 1000 umhos/cm, 200 mg/L chloride, and 1.0 mg/L of boron. These limits were included in
the Basin Plan to ensure that poor quality discharges of oil field produced water to land would not
impair the beneficial uses of groundwater. Subsequently, the Board adopted Resolution 82-136
amending the Basin Plan and providing the Board the flexibility to allow exceeding the limits if a
discharger can demonstrate to the Central Valley Water Board in a public hearing that the
proposed discharge will not substantially affect water quality nor cause a violation of water
quality objectives. The flexibility was added to the Basin Plan because the Board had encountered
instances where discharges were not being allowed because they were only slightly above the
prescribed limits (see Resolution 82-136 and attached Problem Statement). As described in the
CDO and Staff Report, the situation at the McKittrick Facility is different. Valley Water has not
demonstrated that discharges at the Facility can continue without impacting downgradient
beneficial uses. Rather, available data indicate that the discharge is migrating to the northeast and
is substantially affecting downgradient water quality.

Regarding item No. 4, whether a water is "high quality" for the purposes of the Antidegradation
Policy depends on the specific properties or characteristics of the water. Waters can be high
quality for some constituents or beneficial uses, but not for others. The tentative CDO notes that
groundwater around the Facility is suitable for AGR and is being used for AGR. Regarding MUN,

1 Attachments 1.1 and 1.2 show that groundwater at the Clean Harbors Facility, a short distance
2 down structure and down gradient of the Valley Water Facility, has historically and currently
3 contains groundwater with TDS concentrations suitable or potentially suitable for MUN based on
the criteria (of 3000 mg/L or less) in the State's Sources of Drinking Water Policy, Resolution 88-
63.

4 As described above, the discharge exceeds by orders of magnitude the TDS, chloride, and boron
5 concentrations necessary to maintain an AGR beneficial use and the TDS concentrations
6 associated with the Sources of Drinking Water criteria. The discharge is causing a plume in
7 groundwater that is migrating down-structure toward the east and into waters that are suitable for
8 AGR and that meet Sources of Drinking Water Policy criteria for MUN. As described in the
tentative CDO and Staff Report, Board staff believe that the discharge has caused groundwater in
wells downgradient of the Facility to impact the AGR beneficial use and is threatening the water
in other wells. Therefore, the discharge is inconsistent with the Antidegradation Policy in that it
appears to be causing downgradient high quality groundwaters with designated and existing
beneficial uses to exceed water quality objectives.

9
10 **REBUTTAL:** Staff ignore that, in an enforcement action, the Regional Board has the
burden of proof. Thus, Staff would have to demonstrate that there was groundwater under
11 the area of the McKittrick ponds prior to their installation and that water had some
beneficial use. Staff has not provided such evidence and it is not Valley Water's burden to
12 provide such evidence, particularly when being asked to prove a negative. Valley Water's
review of construction documents did not reveal any evidence of groundwater when those
13 ponds were constructed. Even if there had been groundwater under the facility, there were
no uses of that groundwater as the facility was located in a remote location adjacent to oil
14 production facilities. The predominant liquid being pulled from wells in the area in the
15 1950s to 1970s and beyond was oil and produced water, neither of which have any direct
beneficial uses.

16 Staff then discusses that beneficial uses were designated in the areas around and between
17 the McKittrick and Clean Harbors facilities. The facts supporting these designations when
made has not been provided by Staff and it is questionable whether groundwater under
18 produced water facilities and hazardous waste facilities were appropriately designated
with any uses, given that such uses should be discouraged. If MUN and AGR beneficial
19 uses were not properly designated, then the water quality objectives to protect those uses
are not properly applied. Just as where a river is designated MUN, but a tributary thereto
20 is not, the tributary need not meet the MUN-based objectives, but needs to merely ensure
that the river downstream continues to meet such objectives. Staff has not demonstrated
21 that produced water from McKittrick has affected any domestic or agricultural supply
wells or will do so in the next few decades. In that timeframe, Valley Water plans to
22 participate in CV-SALTS and the Prioritization and Optimization (P&O) Study, which
intends to create a Valley-wide solution to the salinity problem, instead of focusing on
23 each source individually, as is being proposed in the CDO.
24

25 The monitoring data that Valley Water intends to collect from new monitoring wells will
26 address the issue of whether the McKittrick ponds can continue to operate during the P&O
Study without impacting downgradient beneficial uses. Valley Water has already
27 determined that the closest municipal drinking water well is more than 2.5 miles away,
and that the agricultural fields to the north have already been affected by northern facility
28 produced water, not from McKittrick.

Staff has not proven that there are any AGR uses near to the McKittrick facility that would be supported by groundwater in the absence of substantial blending or treatment. As shown in the documents contained in the Geotracker report cited as Exhibit 25, the high boron levels of that water alone would make it virtually unusable for AGR without blending. This water cannot be characterized as high quality water and would not be subject to antidegradation requirements. Further, all use designations are approximate because the Tulare Lake Basin Plan recognizes that "Due to the size of the DAU, the listed uses may not exist throughout the DAU."

RTC Comment 29: Regarding the first assertion, Valley Water provided no evidence demonstrating that there was no groundwater beneath the Facility prior to the initiation of its discharge. As explained in Finding 6 of the tentative CDO, in the Detailed Analysis Unit where the Facility is located, the Basin Plan designated beneficial uses of groundwater are MUN, AGR, and IND. The Staff Report and Findings 23 and 33 of the Tentative CDO discuss that the discharges impact these beneficial uses.

Regarding the validity of State Board Resolution 88-63, and the Central Valley Water Board's implementation of Resolution 89-098, Central Valley Regional Water Board staff disagrees with Valley Water's assessment. As the State Water Board explained in State Water Board Water Quality Order 2002-0015 and supported by California Association of Sanitation Agencies v State Water Resources Control Board (2012) 208 Cal.App.4th 1438, the Office of Administrative Law (OAL) issued an advisory determination that the provisions of Resolution 88-63 were regulations subject to the requirements of the California Administrative Procedure Act (APA) (Gov. Code. § 11340 et seq.). But the Legislature subsequently amended the Government Code to provide a different process for OAL review of any plans, policies, guidelines or revisions adopted pursuant to the Porter-Cologne Act after June 1, 1992, and exempting them from the rulemaking provisions of the APA. These provisions also grandfathered in the plans, policies and guidelines adopted prior to June 1992, except for any that were the subject of a civil action as of the effective date of the new statutes. (Gov. Code, § 11353, subd. (c).) No court actions were filed over either Resolution No. 88-63 or the Central Valley Water Board's 1989 Basin Plan amendments and therefore both were exempt from the APA's rulemaking provisions. Thereafter, OAL approved the 1995 Central Valley Basin Plans which incorporated Resolution 88-63.

The text of the Tulare Lake Basin Plan reflects the intent of Regional Board Resolution 89-098 to implement State Board Resolution 88-63 in the Basin Plan. State Water Board Resolution No. 88-63 specifies that except under specifically defined exceptions, all surface and ground waters of the State are suitable or potentially suitable for MUN, and that Regional Boards should designate waterbodies accordingly. (People of California v. Kinder Morgan Energy Partners, L.P. (2008) 569 F.Supp.2d 1073, 1088-89.) Once designated, any change in the beneficial use of a waterbody requires an amendment to the Basin Plan. (E.g., California Ass'n of Sanitation Agencies v. State Water Res. Control Bd. (2012) 208 Cal. App. 4th 1438, 1457,, as modified on denial of reh'g (Sept. 27, 2012).)

As stated in the Basin Plan, due to the Sources of Drinking Water Policy, all surface and groundwaters are designated as MUN (either existing or potential) unless the water body was specifically exempted and listed in the Basin Plan in Table 2-3 as not supporting MUN. Therefore, under the Basin Plan all waters not specifically exempted are designated MUN, regardless of whether they meet the exemption criteria in the Sources of Drinking Water Policy and the Basin Plan. Only through the formal de-designation process will the MUN use be removed from a waterbody. (See State Water Board Order 2002-15, p. 27 noting that due to blanket MUN designation for all unidentified waterbodies in the region, the Central Valley Water Board must go through the rulemaking process to change MUN designation

Regarding the idea that there can be varying levels of protection, the Central Valley Water Board

1 has not provided or implemented different regulatory requirements for uses that are designated
2 “potential” versus “existing.” The water under and around the Facility is currently designated
3 MUN, and absent a basin plan amendment that de-designates the waterbody, the beneficial use
4 must be protected.

5 Regarding the quality of local groundwater, see response to Valley Water Comment No. 3. The
6 data show that groundwater in the upper perched zone, intermediate zone, and lower zone at
7 Clean Harbors, a short distance down structure and down gradient of the Facility, has historically
8 and now contains groundwater with TDS concentrations that meet the criteria in Resolution 88-63
9 for being suitable or potentially suitable for MUN. As the plume from the produced wastewater
10 discharge has migrated into those groundwater zones, regulation of the McKittrick Facility must
11 be protective of those groundwater zones and the designated MUN and other beneficial uses.

12 **REBUTTAL:** See Valley Water’s Rebuttal to RTC Comment 28. In addition, the text of
13 the Basin Plan changed the intent and meaning of the plain text of Res. No. 89-098, which
14 did not designate uses where any of the criteria were met. This resolution, although based
15 on State Board Res. 88-63, represented a stand-alone regulation, which was not properly
16 incorporated verbatim into the Basin Plan. As a result, the interpretation that a Basin Plan
17 amendment is required to remove a use has been perpetuated. A better interpretation, more
18 consistent with the actual text of Res. No. 89-098, is that no designation of MUN occurred
19 where one or more of the criteria were met, which is the case related to the groundwater
20 under and surrounding the McKittrick facility.

21 Further, Staff responses mix discussion of the water bearing zone of the Upper Tulare
22 Sands and the water bearing zone of the Lower Tulare Sands. With respect to the **Upper**
23 **Tulare Sands**, Staff and the text of the CDO both acknowledge that it would be
24 appropriate to de-designate this zone from beneficial uses above a confining clay layer
25 (and with this acknowledgment implicitly recognize that such designation was improper).
26 With respect to the **Lower Tulare Sands**, although the CDO and Staff Report allege
27 produced water from the McKittrick facility is causing impacts to water quality and
28 beneficial uses off-site and downgradient of the Facility, those allegations are based on the
opinion of Board staff, not on facts and evidence (*see* Valley Water’s May 16th
Objections). Valley Water acknowledges that data from the impending downgradient
monitoring wells should resolve this area of uncertainty for Staff. In the meantime, Valley
Water has provided monthly reports to Board staff regarding efforts to obtain permits to
install the downgradient wells as well as information regarding diligently proceeding with
approvals for work within the area of the fully-protected Blunt Nosed Leopard Lizard (*See*
e.g., Exhibits 28 and 30).

29 **RTC Comment 30:** As described in the Response to Valley Water Comments 1, 2, and 12, Board
30 staff believe the CDO is appropriate to ensure that the facility is on an enforceable timeline to
31 achieve compliance with applicable regulatory requirements. Regarding whether the CDO and its
32 timelines are reasonable, Board staff have been trying to get Valley Water to install new
33 downgradient wells for over five years. As noted in the Staff Report, Board staff approved a
34 workplan in January 2015 that included drilling additional wells downgradient. (Staff Report, p.
35 13.) In April 2016, Valley Water submitted a report stating that the proposed wells were in
36 endangered species habitat and that obtaining permits could take between six months and a year.
37 The wells approved in the 2015 workplan have never been installed and Valley Water has been on
38 notice for several years that Board staff believed these wells were necessary to delineate the
groundwater plume. This Board at its April 2018 hearing regarding the matter indicated its
expectation that Valley Water provide groundwater monitoring data to support its discharge by

1 April of 2019. That data have yet to be submitted. The deadlines for a new Report of Waste
2 Discharge, a Closure Plan and Closure Time Schedule and a McKittrick 1 and 1-3 Facility
3 Remediation Workplan are necessary to ensure that groundwater is protected consistent with the
4 Basin Plan.

5 **REBUTTAL:** Valley Water has a demonstrated history of working cooperatively with
6 Staff since at least 2000 to acquire data that the Regional Board requested. *See* Valley
7 Water's chronology in Rebuttal to RTC Comment 12 above. Furthermore, Valley Water is
8 already under 13267 orders and a 2018 MRP. Imposing an enforceable schedule as
9 proposed in the CDO is unreasonable because many of the items proposed are out of
10 Valley Water's reasonable control that could affect its ability to meet the schedule (e.g.,
11 Staff approval of model, use of model for decision making, permit timelines in the event
12 additional wells may be required, etc.). Other requirements in the CDO are also
13 unnecessary because Valley Water has already completed these tasks (e.g., filing a
14 ROWD, determining local well locations, etc.).

15 **RTC Comment 31:** As described throughout this Response to Comments, the Tentative CDO,
16 and the Staff Report, Central Valley Water Board staff disagree with Valley Water's assessment
17 of existing data.

18 **REBUTTAL:** Clearly the two parties disagree, which is the same position the Staff and
19 Valley Water were in last year when we came before the Regional Board in April of 2018.
20 Besides the additional Clean Harbors data, not much additional information has been
21 gathered due to the many difficulties Valley Water has experienced, and unfortunately
22 continues to experience in installing new wells. If the Regional Board were able to order
23 local landowners to allow wells to be drilled and could order its sister regulatory agencies
24 to ignore the laws related to endangered species, then the wells could have been in by
25 now, but those are not realistic powers of the Regional Board and Valley Water is working
26 with all due diligence to get the requested information from which informed decision-
27 making can flow. Valley Water remains confused why Staff believes that action must be
28 taken in June of 2019, and no later, when no wells used for beneficial use are imminently
threatened.

1 **RTC Comment 32:** Baseline water quality immediately under the Facility may not be high
2 quality. However, as described previously, the groundwater downstructure and down gradient of
3 the Facility into which Valley Water's wastewater plume is migrating is high quality with respect
4 to MUN (e.g., meets the criteria of Resolution 88-063) and AGR, for which there is an existing
5 beneficial use. The downgradient aquifers were not impacted by Valley Water's operations in
6 1968 and the Antidegradation Policy does apply to those waters. It is specifically these waters that
7 the tentative CDO is designed to protect as there are existing and potential beneficial uses in those
8 waterbodies

9 **REBUTTAL:** Although the CDO and Staff Report allege produced water from the
10 McKittrick facility is causing impacts to water quality and beneficial uses off-site and
11 downgradient of the Facility, those allegations are based on the opinion of Board staff, not
12 on facts and evidence. (*See e.g.*, COD, page 23: "Staff believes there is a good chance
13 that produced wastewater traveling through channels of coarse grained materials has
14 migrated from the Valley Water Facility"; *see also* Valley Water's May 16th Objections.)

15 *See also* Valley Water's Rebuttal to RTC Comment 3. Chemical analysis of water from

Well No. WW-1 for a water sample collected in February 2008 showed a Total Dissolved Solids (TDS) concentration of 5,860 mg/L and the chloride concentration of 1,800 mg/L, which would not support an AGR or MUN beneficial use without a significant blending volume, and should not be considered an existing use.

Valley Water acknowledges that the groundwater flow model is interim at this time, pending results of the new wells and further work in collaboration with Staff to finalize the model and make it a useful tool for decision-making. However, at Staff's request during the January 10, 2018 meeting on model development, Valley Water ran the model to show continued operation until 2050, and then continuing the model until the water reached an equilibrium state governed by residual saturation. The results of that model show groundwater migration in the Upper Tulare Sands would just reach the Clean Harbors facility in that 30-plus year time frame, as shown below.



RTC Comment 33: The tentative CDO contains a compliance schedule that Board staff believe is appropriate given the site history. The Board has the authority to modify that schedule if it believes more or less time should be authorized. Board staff agrees with Valley Water that under CV-SALTS, if Valley Water is participating in the alternative permitting approach, then participation in the Prioritization and Optimization study (P&O Study) is one element of compliance. The Central Valley Water Board will also require dischargers to continue to implement reasonable, feasible, and practicable efforts to control levels of salt in discharges; maintain current discharge concentrations for salt or mass loading levels and meet any performance-based limits or action levels deemed appropriate and necessary by the Central Valley Water Board. In addition, if Valley Water is seeking an exception to discharge requirements related to the implementation of quality objectives for boron, then Valley Water will need to prepare and implement a boron reduction study work plan or a boron-based watershed management plan. This exception must be approved by the Central Valley Water Board after a hearing. What is sufficient to satisfy BPTC is not appropriate for the hearing on the tentative CDO, but instead should be discussed when Valley Water submits an updated RWD and seeks new WDRs.

1 **REBUTTAL:** Valley Water plans to participate in the alternative permitting approach
2 adopted as part of the recent CV-SALTS Basin Plan Amendments, and then participate in
3 the P&O Study. Staff's CDO essentially forces Valley Water into the Conservative
4 Approach and opines that the P&O Study is just "one element of compliance," which
5 contradicts discussions and findings leading up to the adoption of those Basin Plan
6 Amendments, and the finding by Regional Board Executive Officer in Exhibit 18, page 3,
7 that participation in the P&O Study constitutes Best Practicable Treatment and Control
8 ("BPTC") under the Antidegradation Policy if any high quality water were being
9 impacted, which has not been adequately demonstrated with facts to date.

10 Valley Water believes that CV-SALTS is the appropriate regulatory venue for addressing
11 Staff's concerns with McKittrick and other oil field produced water facilities, as well as
12 other dischargers of salinity and nitrate. Valley Water has been a regular and diligent
13 member of CV-SALTS for several years. However, if Valley Water's facilities are closed
14 one by one, which appears to be Staff's intent, then that will thwart the incentive to be an
15 active participant in CV-SALTS, and a significant funder of the P&O Study.

16 **RTC Comment 34:** Board staff disagree with Valley Water that there is no imminent threat to
17 usable groundwater posed by the Facility. The produced wastewater plume has adversely
18 impacted or threatens to impact the beneficial uses of groundwater currently being used for AGR.
19 While the Board welcomes Valley Water's participation in the CV-SALTS program, such
20 participation does not negate the Board's authority under Water Code section 13301 to require a
21 discharger to cease and desist when the Board finds that a discharge of waste is taking place, or
22 threatening to take place, in violation of waste discharge requirements.

23 **REBUTTAL:** Staff has not produced actual evidence of imminent threat to existing uses
24 of groundwater (not in areas where blending is required due to the background levels or
25 pre-existing levels of water quality constituents). Staff has also not proven, with
26 substantial evidence in the record, that any violation of Valley Water's current WDR has
27 occurred. Valley Water has presented data in its response to the CDO demonstrating that
28 beneficial uses are not impaired by the McKittrick facility, and that any areas of
29 disagreement will be resolved through the planned additional data collection.

30 **RTC Comment 35:** See Responses to Valley Water Comments Nos. 33 and 34

31 **REBUTTAL:** See Valley Water's Rebuttal to RTC Comments 33 and 34.

32 **RTC Comment 36:** As described in the Staff Report, General Order Three requires dischargers
33 to either demonstrate that there is no groundwater beneath the discharge areas and that produced
34 wastewater and constituents associated with other approved wastes discharged will not migrate
35 into areas that there is groundwater with designated beneficial uses, or if there is groundwater
36 underlying the discharge location, demonstrate that the current Basin Plan groundwater beneficial
37 uses are eligible for de-designation.

38 There is poor quality groundwater directly under the Facility that may be suitable for de-
39 designation. However, there is also groundwater immediately downstructure and down gradient of
40 the Facility that is suitable for beneficial use and that is within the influence of the Facility. In
41 Board staff's opinion, the beneficial uses of the nearby downgradient waters likely are not eligible
42 for de-designation because the quality of this groundwater is suitable for its designated beneficial
43 uses and groundwater is beneficially used within a short distance from the Facility. Further,
44 Valley Water's produced wastewater has migrated to the north and east and beyond the Facility

1 groundwater monitoring well network. To date, the extent of plume migration has not been fully
2 characterized, but given the local hydrogeology, it is expected to remain uncontained and
3 continue to migrate to the north and east. Based on the current data, Board staff believes the
4 discharge cannot comply with General Order No. 3. The tentative CDO provides Valley Water
5 limited time to gather additional evidence to demonstrate that General Order Number 3 is
6 appropriate. In addition, Valley Water could seek a Basin Plan amendment and attempt to
7 dedesignate those beneficial uses assigned to groundwater directly beneath the Facility; it does
8 not have to be under General Order No. 3 to seek a Basin Plan amendment.

9 **REBUTTAL:** See Valley Water's Rebuttal to RTC Comment 29 (showing agreement
10 about improper designation status of Upper Tulare Sands and disagreement over Lower
11 Tulare Sands), and Rebuttal to RTC Comment 32 (current model result showing 30 years
12 to get to Clean Harbors).

13 **RTC Comment 37:** Board staff do not necessarily disagree with Valley Water's assessment in
14 this regard. However, Valley Water does have other options including moving the Facility
15 discharge to a location that is not upstructure and upgradient of groundwater with beneficial uses
16 and deep well underground injection into formations that contain water that is not suitable for
17 beneficial uses. Much of the oil field produced wastewater generated in the State and the Central
18 Valley is disposed of through injection, including the water that used to be discharged to the
19 Valley Water facilities in the Edison Oil Field.

20 **REBUTTAL:** Valley Water seeks to demonstrate that the current McKittrick location is
21 suitable for this use until the results and implementation of the P&O Study are complete.
22 Valley Water believes that Staff may raise the same objections for any other location,
23 including for underground injection as those aquifers were arguably designated with
24 inappropriate and inapplicable uses as well since the use designation process is not clear
25 as to spatial and vertical extent.

26 **RTC Comment 38:** In *Topanga Association for a Scenic Community v. County of Los Angeles*
27 (1974) 11 Cal.3d 506, 514-15, the Court held that an agency must set forth findings to bridge the
28 analytic gap between the raw evidence and the ultimate order. However, great specificity is not
required, and findings are to be liberally construed to support rather than defeat the decision under
review. (*Topanga Assn. for a Scenic Community v. County of Los Angeles* (1989) 214 Cal.App.3d
1348, 1356.) The tentative CDO and the Staff Report both discuss the impacts of the Facility's
produced wastewater discharge, particularly on downgradient wells and how that has changed
over time demonstrating the plume's movement farther from the Facility. The tentative CDO and
Staff Report then demonstrate how those impacts are affecting downgradient wells and adversely
impacting or threatening to impact the beneficial uses of groundwater, particularly of AGR.
Finally, finding 37 of the tentative CDO concludes how the reports and actions required by the
tentative CDO are necessary to define the lateral and vertical extent of the plume, ensure that
Valley Water complied with the requirements of the tentative CDO and ensure that Valley Water
brings the Facility into compliance with WDRs, the Basin Plan, and the Water Code. This is all
that is required by Topanga, and the tentative CDO is supported by substantial evidence.

29 **REBUTTAL:** Valley Water agrees that data is still needed to define the lateral and
30 vertical extent of the produced water migration. Without that evidence, Staff cannot
31 definitively demonstrate any impacts on downgradient wells. For this reason, the CDO
32 hearing should be deferred until that evidence is available and can be presented to the
33 Regional Board Members.

1 **RTC Comment 39:** Government Code section 11425.10 states that an agency conducting an
2 adjudicative proceeding must separate the adjudicative function from the investigative,
3 prosecutorial, and advocacy functions within the agency. (Government Code §11425.10,
4 subd.(a)(4).). The tentative CDO is not a prosecutorial action, so there are no prosecutorial
5 functions to separate from the adjudicative proceeding. This is not an Administrative Civil
6 Liability proceeding with the potential for imposition of penalties. Instead, it is a CDO which is
7 more similar to a 13267 Investigative Order, a time schedule in waste discharge requirements
8 prescribed under Water Code section 13263, or a Conditional Prohibition, neither of which
9 actions are considered prosecutorial. Valley Water has been provided with full due process
10 through a formal hearing with the opportunity to present witnesses and cross-examine Central
11 Valley Water Board staff. In addition, the Central Valley Water Board is an impartial, fair
12 decision maker that is free of bias.

13 **REBUTTAL:** A CDO is an enforcement action requiring prosecution, as evidenced by
14 the fact that the State Water Board's Enforcement Policy includes CDOs in its litany of
15 potential enforcement actions.⁴ (See Enforcement Policy, Appendix A at p. 5, Section D.7
16 related to **Formal Enforcement Actions** (The 2017 Enforcement Policy is accessible at:
17 https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2017/040417_9_final%20adopted%20policy.pdf.)

18 Staff's contention that adjudicative functions do not need to be separated is rebutted by the
19 clear language of the Enforcement Policy at page 5 ("Appropriate protocols should be
20 established by Water Board leadership to maintain separation of functions between
21 enforcement staff attending the prioritization meeting and staff who may serve in an
22 advisory capacity to the Board at an adjudicatory hearing"), and by the fact that, in the last
23 CDO hearing that Valley Water underwent for the Edison facility, there was a Prosecution
24 Team and an Advisory Team. In this case, Staff is undertaking both duties, acting as both
25 prosecutor and advisor, which has been deemed unlawful in the cases cited by Valley
26 Water in its April 8th submittal.

27 **II. CONCLUSION**

28 For the reasons set forth in Valley Water's April 8th submission and herein, Valley Water believes
that justice would be best served by delaying the CDO hearing until further data can be gathered
from new monitoring wells. As demonstrated herein, there is no imminent threat requiring
immediate action. Valley Water's McKittrick ponds have been operating under a Regional Board
WDR for 50 years, waiting for this additional data will not cause any sudden or unexpected
changes in local water quality.

Respectfully submitted,

Dated: May 20, 2019

DOWNEY BRAND LLP

By: 

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⁴ It should be noted that the Enforcement Policy states "CDOs are often issued to dischargers with chronic non-compliance problems." Staff has not justified the imposition of the proposed CDO Valley Water on this ground.